WHAT IS CLAIMED IS:

1. A passive cooling system for an auxiliary power unit installation on an aircraft, comprising:

an auxiliary power unit housed within a nacelle of the aircraft, the auxiliary power unit comprising at least a compressor portion of a gas turbine engine and an oil cooler contained separately within said nacelle;

an engine exhaust opening defined in the aft portion of said nacelle and communicating with said gas turbine engine;

at least a first air inlet duct communicating with a second opening defined in said nacelle and with said compressor portion; and

said oil cooler located within a second duct communicating with an opening other than the engine exhaust opening of said nacelle and with said engine exhaust opening, whereby exterior cooling air and engine exhaust ejected through said engine exhaust opening, entrain cooling air through said second duct to said oil cooler, providing engine oil cooling.

2. The passive cooling system as defined in claim 1, wherein said second duct is bifurcated from said first air inlet duct, and extends downstream from said first duct portion, and a third duct portion, also formed

downstream of said first duct portion, communicates with said compressor portion.

3. The passive cooling system as defined in claim 1, wherein said second duct is communicating with a third opening defined in said nacelle and with said engine exhaust opening.

4. The passive cooling system as defined in claim 1, wherein said compressor portion comprises a load compressor and a core compressor.

5. The passive cooling system as defined in claim 1, wherein an opening defined in one of said first duct and said second duct, is in communication with the exterior of said gas turbine engine within said nacelle.

6. The passive cooling system as defined in claim 2, wherein said first duct comprises an airflow splitter with a leading edge upstream of the bifurcation of said second duct, and said second duct empties into said nacelle downstream of said oil cooler.

7. The passive cooling system as defined in claim 1, wherein said oil cooler comprises an air to oil heat exchanger.

8. The passive cooling system as defined in claim 1, wherein said engine exhaust opening is in fluid flow communication with an exhaust eductor assembly.

9. The passive cooling system as defined in claim 1, wherein said nacelle is located within the tailcone of the aircraft.

10. The passive cooling system as defined in claim 1, wherein said nacelle has external access doors.

11. The passive cooling system as defined in claim 1, wherein said second duct is integrated with a compressor surge bleed duct, downstream of said oil cooler.

12. The passive cooling system as defined in claim 8, wherein said exhaust eductor assembly comprises a dedicated opening for the exit of cooling air from said nacelle.

13. The passive cooling system as defined in claim 8, wherein protection for said gas turbine engine from foreign object damage is provided.

14. The passive cooling system as defined in claim 13, wherein said second duct is in direct communication with said exhaust eductor, said oil cooler is located at the junction of said second duct and said exhaust eductor, and said oil cooler is oriented parallel to and offset from the airflow through said second duct.

15. The passive cooling system as defined in claim 14, wherein a scavenge discharge duct is in fluid flow

communication with said second duct and with a further opening defined in said nacelle.

16. The passive cooling system as defined in claim 8, wherein said second duct is directly communicating with a third opening defined in said nacelle and with said exhaust eductor assembly, said oil cooler is located at the junction of said second duct and said exhaust eductor assembly, and said oil cooler is oriented perpendicular to the airflow through said second duct.

17. The passive cooling system as defined in claim 16, wherein said second duct comprises a dedicated opening for one of an inlet and an exit of cooling air for said nacelle.

18. The passive cooling system as defined in claim 8, wherein a further opening defined in said nacelle is in communication with said exhaust eductor assembly.

19. The passive cooling system as defined in claim 18, wherein said further opening is an air inlet to said nacelle and said exhaust eductor provides an air exit from said nacelle.

20. The passive cooling system as defined in claim 19, wherein said further opening and said exhaust eductor are in communication via one of a dedicated opening in said exhaust eductor and a dedicated opening in said second duct.

21. The passive cooling system as defined in claim 8, wherein said exhaust eductor assembly is in fluid flow communication with a compressor surge bleed duct.

22. The passive cooling system as defined in claim 8, wherein said exhaust eductor assembly is in direct fluid flow communication with said second duct.

23. The passive cooling system as defined in claim 22, wherein mixing nozzles within said exhaust eductor assembly integrate said cooling air from said second duct with said engine exhaust.

24. The passive cooling system as defined in claim 23, wherein said exhaust eductor assembly comprises an axisymmetric primary nozzle located upstream of said mixing nozzles.

25. The passive cooling system as defined in claim 24, wherein said axisymmetric primary nozzle defines a velocity of said engine exhaust, and correspondingly a volume of said cooling air entrained through said second duct.

26. The passive cooling system as defined in claim 24, wherein said axisymmetric primary nozzle is defined by an outer annular shroud and a central exhaust plug.

27. The passive cooling system as defined in claim 26, wherein said central exhaust plug comprises cavities therein for providing acoustic treatment.

28. The passive cooling system as defined in claim 27, wherein said cavities attenuate low frequency sounds.

29. A passive cooling system for an auxiliary power unit installation on an aircraft, comprising:

an auxiliary power unit housed within a nacelle of the aircraft, the auxiliary power unit comprising at least a compressor portion of a gas turbine engine and an oil cooler contained separately within said nacelle;

an engine exhaust opening defined in the aft portion of said nacelle and communicating with said gas turbine engine via an exhaust eductor assembly;

said exhaust eductor assembly being in fluid flow communication with a compressor surge bleed duct;

at least a first air inlet duct communicating with a second opening defined in said nacelle and with said compressor portion; and

said oil cooler located within a second duct communicating with an opening other than the engine exhaust opening of said nacelle and with said engine exhaust opening, whereby exterior cooling air and engine exhaust ejected through said exhaust eductor assembly, entrain cooling air through said second duct to said oil cooler, providing engine oil cooling.

30. The passive cooling system as defined in claim 29, wherein said exhaust eductor assembly comprises an

annular axisymmetric primary nozzle upstream of a plurality of radially located mixing nozzles.

31. The passive cooling system as defined in claim 30, wherein said mixing nozzles integrate said cooling air from said second duct with said engine exhaust.

32. The passive cooling system as defined in claim 31, wherein said annular axisymmetric primary nozzle defines a velocity of said engine exhaust, and correspondingly a volume of said cooling air entrained through said second duct.

33. The passive cooling system as defined in claim 32, wherein said annular axisymmetric primary nozzle is defined by outer annular shroud and a central exhaust plug.

34. The passive cooling system as defined in claim 33, wherein said central exhaust plug comprises internal cavities adapted to provide acoustic attenuation.